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10/617,210	07/11/2003	Christian Georg Gerlach	Q76413	3108

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EXAMINER	
WOZNIAK, JAMES S	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/617,210	GERLACH, CHRISTIAN GEORG	
	Examiner	Art Unit	
	JAMES S. WOZNIAK	2626	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *29 February 2008*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1,3-9,11,13 and 15-20* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,3-9,11,13 and 15-20* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *2/29/2008* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Response to Amendment

1. In response to the office action from 2/14/2008, the applicant has submitted a request for continued examination, filed 2/29/2008, amending independent claims 1 and 7, while arguing to traverse the art rejection based on the limitation regarding the use of a specific cross multiplication expression for each code vector *(Amendment, Page 12)*.

2. In response to the Fig. 3 amendment, the examiner has withdrawn the previous drawing objection.

3. In response to amended Fig. 1, the examiner has withdrawn the previous objection directed toward minor informalities.

4. In response to the amended claims, the examiner has withdrawn the previous 35 U.S.C. 101 rejections.

5. In response to the amended claims, the examiner has withdrawn the previous 35 U.S.C. 112, first and second paragraph rejections.

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Response to Arguments

6. Applicant's arguments have been fully considered but they are not persuasive for the following reasons:

With respect to **Claims 1 and 7** and their dependents, the applicant argues that Kwan et al *("Implementation of DSP-RAM: An Architecture for Parallel Digital Signal Processing in Memory," 2001)* fails to teach "using a Cross/Energy expression for every vector" as is recited in amended claim 1 because Kwan relies on an L2 norm calculation for determining an optimal codevector in his parallel-processing vector quantizer *(Amendment, Pages 12-13)*. These arguments have been fully considered, but are moot with respect to the new grounds of rejection in further view of Davidson et al *(U.S. Patent: 4,868,867)*. It is also noted that this common cross-multiplication calculation is likewise found in Gerson *(U.S. Patent: 4,817,157) (Col. 14)*, which is included in the PTO-892 form for the applicant's consideration.

Specification

7. The disclosure is objected to because of the following informalities: Page 8 recites "the higher the lower a corresponding error energy", which requires correction/clarification.

Appropriate correction is required.

Claim Objections

8. **Claims 1, 3-9, 11, 13, and 15-20** are objected to because of the following informalities: In **claims 1 and 7**, the variables recited in the cross multiplication expression should be explained in order to clarify their meaning in the claim *(i.e., the claim should be amended to fully incorporate claim 4)*. The remaining dependent claims are rejected as being indefinite by virtue of their dependency.

Appropriate correction is required.

Claim Rejections - 35 USC § 112

9. The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

10. **Claim 5** is rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention. Claim 5 recites performing various CELP processing functions in parallel, however, the specification does not sufficiently describe such parallel processing. More specifically, the specification only describes a complex vector quantization technique implemented in a parallel processor in detail and merely makes a general mention that parallel processing can be applied to the other CELP functions *(Pages 9-10)*. This

general mention of parallel processing does not specifically explain how the various CELP coding processes would be performed in parallel *(as is the case with vector quantization)*, and thus, the specification would not enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention recited in claim 5.

11. **Claim 19** is rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. Claim 19 recites that a sequence of searching can be changed using a cross-multiplication expression. Although the specification recites such an expression, it fails to make any mention that a sequence of searching can be changed using said expression. Thus, claim 19 fails to comply with the written description requirement.

12. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

13. **Claims 1, 3-9, 11, 13, and 15-20** are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claims 1 and 7 recite the limitation "wherein a cross multiplication expression...is *used* for each code vector". It is uncertain what is meant by this limitation. How and for what is the cross multiplication used for the code vector? Is it used in place of each vector or as a way of

comparing code vectors in an optimal search as is recited in claim 4? Thus, since the limitation "used for each code vector" is unclear, claims 1 and 7 are indefinite. It is believed that the cross multiplication expression is used in determining an optimal codevector as is recited in claim 4. This limitation will be interpreted as such for the application of the prior art of record. The remaining dependent claims are rejected as being indefinite by virtue of their dependency.

The metes and bounds of **claim 19** are indefinite because changing a sequence of searching is not positively recited in the claim *("can be changed")*. Thus, since it is uncertain whether such a change actually requires being performed, claim 19 is indefinite.

Claim Rejections - 35 USC § 103

14. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

15. **Claims 1, 3-9, and 11, 13, and 15-20** are rejected under 35 U.S.C. 103(a) as being unpatentable over Kwan et al *("Implementation of DSP-RAM: An Architecture for Parallel Digital Signal Processing in Memory," 2001)* in view of Davidson et al *(U.S. Patent: 4,868,867)*.

With respect to **Claim 1**, Kwan recites:

K code vectors is provided for vector quantization of a signal vector representing a set of signal values of said audio or speech signal *(codeword vectors corresponding to a speech signal, Section 3.3, Page 344)*,

Performing a codebook search for determining an optimal code vector of said codebook, wherein said codebook search is performed in parallel by *(codebook search performed in parallel, Section 3.3, Pages 344-345)*:

Dividing the codebook into a plurality of codebook groups *(distributing a voice codebook over multiple processing elements, Section 3.3, Pages 344-345; and Fig. 6)*;

Simultaneously determining a plurality of optimal group code vector each of which corresponds to one of said plurality of codebook groups *(simultaneously determining a lowest error vector match with each divided codevector set, Section 3.3, Pages 344-345)*; and

Determining an optimal code vector of said codebook from the plurality of optimal group code vectors *(finding the closest matching codevector over all of the processing elements, Section 3.3, Pages 344-345)*; and

Outputting the code vector *(sending optimal code vectors, Section 3.3, Page 344)*,

Wherein said determining of said optimal code vector among said plurality of optimal group code vectors comprises evaluating an index of each optimal group code vector uniquely identifying each optimal group code vector within said codebook *(speech vectors having a defining index at which the vector is located, Section 3.3, Page 344, which is analyzed to access the corresponding optimal vector for each group to determine/calculate the overall best codevector, Section 3.3, Pages 344-345)*.

Although Kwan notes that several different error functions can be used to determine an optimal vector *(Section 3.3, Page 344)*, Kwan does not explicitly teach the use of a cross-multiplication expression as a means for vector selection. Such an expression, however, is well known in the speech coding art as is evidenced by Davidson (*Col. 12, Lines 15-59)*.

Kwan and Davidson are analogous art because they are from a similar field of endeavor in speech coding. Thus, it would have been obvious to a person of ordinary skill in the art, at the time of invention, to modify the teachings of Kwan with the cross-multiplication expression taught by Davidson in order to provide a comparison scheme that is suitable for a DSP that has low memory requirements *(Davidson, Col. 12, Lines 52-54)*.

With respect to **Claim 3**, Kwan recites the parallel process for encoding a voice signal as applied to Claim 1. Although Kwan does not explicitly describe the entire encoding process in detail, including a shape-gain step, such a step is well known in the speech coding art as is evidenced by Davidson *(Col. 16, Lines 32-56)*.

Kwan and Davidson are analogous art because they are from a similar field of endeavor in speech coding. Thus, it would have been obvious to a person of ordinary skill in the art, at the time of invention, to modify the teachings of Kwan with the well known gain factor taught by Davidson in order to provide information required for speech synthesis at a decoder that also minimizes distortion in a reproduced speech signal *(Kwan, Col. 3, Lines 7-18)*.

Claim 4 contains subject matter similar in scope to claim 1, and thus, is rejected under similar rationale.

With respect to **Claim 5**, Kwan discloses full implementation of a CELP coder/decoder and explains parallel processing for an aspect of the full process *(Sections 3.3-4, Pages 344-345)*,

while Davidson further discloses well-known CELP processing means including a synthesizing section and stored auto-correlation/impulse response matricies *(Col. 12, Line 60- Col. 13, Line 19; Col. 14, Lines 15-56; and Fig. 5)*.

With respect to **Claim 6**, Kwan further discloses:

The codebook comprises pulse code vectors *(CELP codevectors, which comprise excitation pulse vectors, Section 3.3, Page 345)*.

With respect to **Claim 7**, Kwan teaches the method of claim 1 and further discloses:

A processor with configurable hardware and/or with acceleration means specifically designed for said method is used for parallel execution of steps of said method *(digital signal processor (configurable hardware) with parallel processing elements (i.e., acceleration means) for faster codebook searching (acceleration means), Fig. 6)*.

With respect to **Claim 8**, Kwan further discloses:

The processor provides means for simultaneously accessing a plurality of said signal values located in a memory *(simultaneously accessing many stored code vectors in parallel processing elements, Section 3.3, Pages 344-345)*.

With respect to **Claim 9**, Kwan further discloses:

A standard processor further comprising a calculation module, is used for parallel execution of steps of said method, and wherein said steps of said method are optimized regarding calculation means of said standard processor and/or execution time *(DSP programmed calculation means used to enable parallel speech coding with increased speed and efficiency, Section 3.3 and 4, Pages 344-345)*.

With respect to **Claim 11**, Kwan further discloses:

Coder and decoder, in particular speech and/or audio signal CODEC, capable of performing a method according to claim 1 *(voice coding and decoding, Section 3.3 and 4, Pages 344-345)*.

With respect to **Claim 12**, Kwan further discloses:

The signal is an audio or speech signal *(voice coding, Section 3.3, Page 344-345)*.

With respect to **Claim 13**, Kwan further discloses:

The processor is a digital signal processor *(DSP, Sections 3.3 and 4, Pages 344-345)*.

With respect to **Claim 14**, Kwan further discloses:

The coder and decoder are at least one of speech and audio signal Codecs *(G.728 voice coder/decoder, Section 4, Page 345)*.

With respect to **Claim 15**, Kwan further discloses:

A plurality of calculation units, each of which determines optimal code group vectors of a respective one of the plurality of codebook groups, wherein the plurality of calculation unit execute said determining simultaneously *(plurality of parallel processing elements that each determine a best match within each codevector set, Section 3.3, Page 345 and Fig. 6)*.

With respect to **Claim 16**, Kwan further discloses:

Each codebook group comprises a number of code vectors wherein the number of code vectors is a fraction of the plurality of code vectors (codebook is divided into smaller codevector sets, Fig. 6).

With respect to **Claim 17**, Kwan further discloses:

Each code vector is uniquely identifiable by a unique index *(code vectors are each assigned an index, Section 3.3, Page 344)*.

With respect to **Claim 18**, Kwan further discloses:

The code vectors contained in a first codebook group are mutually exclusive from the code vectors contained in a second codebook group *(different codebook sets are assigned to each processing element to increase searching speech, Fig. 6; and Section 3.3, Page 345).*

With respect to **Claim 19**, Davidson further discloses:

A sequence of searching can be changed using said cross multiplication expression *(searching sequence/comparisons are altered based on a cross-multiplication operation result, Col. 12, Lines 15-51).*

With respect to **Claim 20**, Kwan further discloses:

Evaluating an index of each optimal group code vector ensures conformity with a linear search method *(evaluation of different codeword indexes in a vector search conforms to the coding search standards used in a typical linear search, Section 3.3, Page 344).*

Conclusion

16. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure: See PTO-892.

17. Any inquiry concerning this communication or earlier communications from the examiner should be directed to James S. Wozniak whose telephone number is (571) 272-7632. The examiner can normally be reached on M-Th, 7:30-5:00, F, 7:30-4, Off Alternate Fridays.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick Edouard can be reached at (571) 272-7603. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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